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Conservation Systems Research

Cover Crops and Minimum Tillage for Sweetpotato Production

RESEARCH PROJECT DESCRIPTION NO. 32

Original vegetable planter

Researchers

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The Challenge

Sweetpotatoes are of tropical origin (Peru), and can only be grown during the warmest months in Alabama. Well-drained, sandy and sandy loam soils are required to produce the best-shaped sweetpotatoes. Our goal is to use modern, soil conservation tillage systems to provide better growing conditions in sweetpotato production. To gain benefits from conservation tillage systems – such as improved soil infiltration, suppression of weed growth, reduced compaction, and increased soil organic matter – cover crops and minimum tillage will be used prior planting. A roller will be used for

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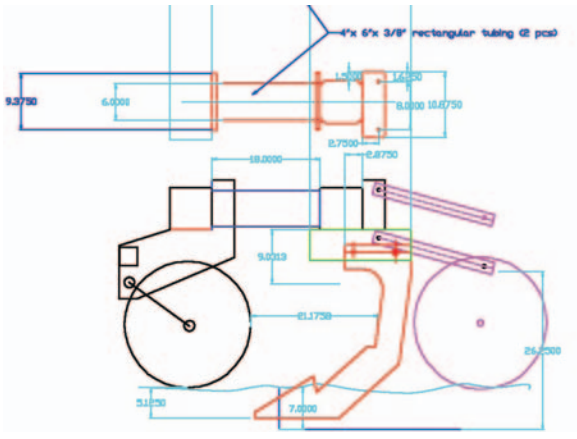
termination/flattening of the cover crops and a sweetpotato planter, modified for minimum-tillage systems, will be used to plant sweetpotatoes in various cover crops residues.

The Experiment

Experiments are being conducted at two Alabama Agricultural Experiment Stations – North Alabama Horticulture Research Center (Cullman) and E.V. Smith Research Center (Milstead) – to:

1. Determine the influence of various cover crops, N rate, and tillage systems on growth and yield of Beauregard sweetpotato, and
2. Evaluate the effects of the various sweetpotato production systems above on
   - Soil compaction;
   - Soil moisture;
   - Biomass produced by cover crops;
   - C:N ratios;
   - Soil temperatures;
   - Bulk density;
   - Weed counts;
   - Economics



Designing a modified no-till vegetable planter

The two experimental sites, Cullman (northern Alabama) and Milstead (central Alabama) differ in their climate, soils, and other ecological factors. These differences will allow us to make observations under different conditions and apply what we learn to more regions.

The cover crops being evaluated are: crimson clover, black oat, rye, wheat, and none. Nitrogen rates are 45 and 90 pounds per acre. The tillage systems being compared are conventional tillage and minimum tillage, using a shank mounted in front of the transplanter to open up the soil.

Related Publications

Tillage requirements for winter-annual grazing rotations. Project Description #4b. USDA-ARS National Soil Dynamics Unit, Conservation Systems Research. 2002. 2 pp.